Clean Version of CIP Claims

What I claim:

34. A mini plasma display, comprising in combination:

(a) semiconductor substrate,

(b) gas containment cavity array formed in said semiconductor substrate,

(c) columnar electrodes interconnecting gas cavities in groups,

(d) row electrodes orthogonal to columnar electrodes interconnecting gas cavities in groups,

(e) hermetic sealing and gas filling means,

(f) electronic enabling means of said electrodes to allow activation of selected individual gas containment cavity providing luminous glow discharge of said individual gas cavity,

(g) electronic enabling means of said electrodes to allow bistable transfer of said luminous glow discharge from said individual gas cavity to subsequent gas cavities along a recurring path by pulsed sequential activation,

wherein the improvement is a method for eliminating orthogonal X-Y addressing as well as enhanced structure for construction of a mini display panel of the plasma type.

35. A mini plasma display, comprising in combination:

(a) semiconductor substrate,

(b) transparent viewing faceplate bonded to said semiconductor substrate,

(c) gas containment cavity array etched in said semiconductor substrate wherein said gas containment cavities are bottomed and floored by said transparent viewing plate.

(d) electrodes interconnecting gas cavities in columnar array in cathode groups,

(e) back plate containing rows of anode electrodes in groups orthogonal to columnar electrodes,

(f) back plate containing said anodes orthogonally matched and aligned to face said cathode electrodes peripherally sealed hermetically to cathode plate including gas filling means,

(g) electronic enabling means of said electrodes to allow activation of selected individual gas containment cavity providing luminous glow discharge of said individual gas cavity,,

(h) electronic enabling means of said electrodes to allowing bistable transfer of said luminous glow discharge from said individual gas cavity to subsequent gas cavities along a recurring path by pulsed sequential activation,

wherein the improvement is a hermetic sealing method whereby the back panel containing the anodes is sealed to the front panel structure containing the cathodes wherein the structural strength of the mini display is enhanced by each individual gas cavity being hermetically bonded around its full peripheral extent to the transparent viewing faceplate and wherein the luminous glow discharge is fully visible and unobscured by electrodes.

36. A mini plasma display, comprising in combination:

(a) semiconductor substrate of at least two layers differing in etch rate properties wherein the respective etch rates control the dimensional size and therefore the volume of the gas cavity so formed in each layer,

(b) transparent viewing faceplate bonded to said semiconductor substrate,

(c) gas containment cavity array etched in said layers of semiconductor substrate whereby said gas containment cavities in said semiconductor layers are axially coincident but differ in size extent and volume dependent upon respective etch rate of said semiconductor layers and wherein said gas cavities may be bottomed and floored by a semiconductor layer or by said transparent viewing side faceplate,

(c) ionization slots each cavity in row direction said ionization slots allowing sustained glow discharge ionization extending to immediately preceding and immediately succeeding cavities in the row therein,

(d) cathode electrodes interconnecting gas cavities in columnar array in groups,

(e) back plate containing rows of anode electrodes in groups orthogonal to columnar electrodes,

(f) back plate containing said anode electrodes in groups orthogonally matched and aligned to face said cathode electrodes peripherally sealed hermetically to cathode plate including gas filling means,

(g) electronic enabling means of said electrodes allowing activation of selected individual gas containment cavity providing luminous glow discharge of said individual gas cavity,

(h) electronic enabling means of said electrodes to allowing bistable transfer of said luminous glow discharge from said individual gas cavity to subsequent gas cavities along a recurring path by pulsed sequential electrical activation as required for TV standard interlaced scanning,

wherein the improvement is a method to achieve hollow cathode structures for enhanced glow discharge luminosity plus IR imaging capability wherein the semiconductor layer on the transparent faceplate side is left intact as opaque to visible light.

37. A mini plasma display of claims 34, 35, and 36 wherein said semiconductor substrate is silicon of <100> crystal orientation.

38. A mini plasma display of claims 35 and 36 wherein said semiconductor substrate is anodically bonded to said transparent viewing faceplate.

39. A mini plasma display panel of claim 36 wherein cavity array pattern is etched in top silicon layer whereby cavities so formed are used as etch mask to define cavities in underlying silicon layer whereby underlying cavities so formed are contingent to top layer cavities using top layer cavities as etch mask,

40. A mini plasma display panel of claim 36 wherein said silicon substrate is comprised of a layer of silicon of reduced etch rate in selected chemical atop silicon layer of enhanced etch rate

which is in turn on top of transparent viewing faceplate allowing formation of hollow cathode structures with enhanced dimensional extent on transparent viewing faceplate side.

41. A mini plasma display panel of claim 36 wherein said silicon substrate is comprised of a top layer of silicon of enhanced etch rate in selected chemical on top of silicon layer of reduced etch rate which in turn is on top of transparent viewing faceplate thus allowing formation of hollow cathodes with reduced dimensional extent on transparent viewing faceplate side.

42. The mini plasma display panel of claim 40 wherein top silicon layer is boron doped P-type <100> and the bottom layer is N-type <100> silicon providing hollow cavities with enhanced dimensional extent on transparent viewing plate side allowing hollow cathode structures with increased lumens.

43. The mini plasma display panel of claim 41 wherein top silicon layer is N-type <100> and bottom layer is P-type <100> silicon providing hollow cavities with reduced dimensional extent on transparent viewing plate side for forming hollow cathode structures with increased lumens.

44. The mini plasma display of claims 36 wherein said gas containment cavity array pattern is etched in top silicon layer until bottomed by etch-resistant under-layer of silicon thereby providing desirable flat-bottomed gas cavities of precise dimensions for an improved IR display.

45. The mini plasma display of claim 44 wherein said gas containment cavity array pattern is etched in top N-type <100> silicon layer until bottomed by etch-resistant under-layer of highly doped P-type <100> silicon thereby providing desirable flat-bottomed gas cavities of precise dimensions for an improved IR display.

46. The mini plasma display of claims 35 and 36 whereby viewing of said glow discharge from said transparent faceplate side is unobstructed by electrode elements.

47. The mini plasma display of claims 34, 35, and 36 further including at each pixel element transparent electrodes for activation of selected color phosphors whereby signal activation in scanned synchronism with luminous gaseous discharge of phosphors at selected pixel elements provides light and color values in correspondence with supplied television signal means.

48. The mini plasma display panel of claims 35 and 36 wherein said array pattern of gas containment cavities in silicon bonded to transparent viewing plate provides increased structural strength allowing increased gas pressure in said cavities at hermetic sealing thereby providing increased lumens.

49. The mini plasma display panel of claim 1, 2, and 3 further including electrical enabling means activating glow discharge scanning comprising television field and frame timing pulses applied to selected columnar electrodes, connected in groups of three, and row anode electrodes to cooperatively provide a recurring bistable transfer of the luminous glow discharge in a raster pattern in synchronism with supplied television signals.

50. The mini plasma display panel as defined in claims 1, 2, and 3 wherein the scanned gas discharge light pixels of increased lumens are used as a scanned lighting source to cooperatively provide a recurring raster pattern for a LCD display.

51. The mini plasma display panel as defined in claims 1, 2, and 3 wherein the scanned light pixels of increased lumens are used as an areal lighting source.